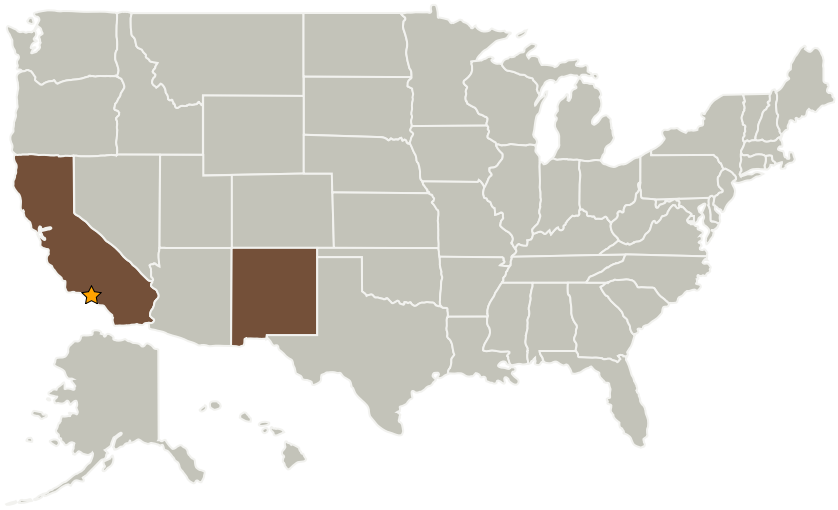
Lunar Regolith Stabilization for Excavation, Phase I

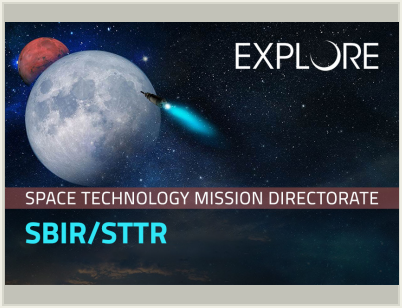
Completed Technology Project (2008 - 2008)

Project Introduction

Establishing human presence outside the protective cover of earth's atmosphere is a challenge. On earth, the atmosphere does not only present breathing gas, it also acts as a thermal buffer and protects the biosphere from harmful radiation. Shielding of humans from harmful radiation during long-term stays on an extraterrestrial body like the moon is a difficult task. Lunar regolith provides an excellent source of readily available insulation and shielding material. About 2 m of packed regolith would provide an excellent cover for a permanent installation.. In order to either bury shelters or to surround habitats with berms of protective material, it is necessary to excavate regolith on a large scale, a difficult undertaking due to the dustlike consistency of the material. To stabilize the regolith, it is necessary to either consolidate the surface material of the slopes or to convert the regolith into a solid building material. Adherent Technologies, Inc. has developed several specialty resins for material stabilization. This includes penetrating urethane foam for asbestos remediation and epoxy resins for borehole casings in dry-drilling applications. ATI now proposes to develop a stabilization system for lunar surface dusts using a polyurethane foam binder.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Adherent Technologies, Inc.	Supporting Organization	Industry	Albuquerque, New Mexico

Primary U.S. Work Locations	
California	New Mexico

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jan-michael Gosau

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.1 In-Situ Resource Utilization
    - TX07.1.2 Resource Acquisition, Isolation, and Preparation